

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549**

FORM S-8

**REGISTRATION STATEMENT
under the
SECURITIES ACT OF 1933**

SYNTA PHARMACEUTICALS CORP.

(Exact Name of Registrant as Specified in Its Charter)

Delaware
(State or Other Jurisdiction
of Incorporation or Organization)

**125 Hartwell Avenue
Lexington, Massachusetts 02421**
(Address, Including Zip Code, of
Principal Executive Offices)

04-3508648
(I.R.S. Employer
Identification No.)

SYNTA PHARMACEUTICALS CORP. AMENDED 2015 STOCK PLAN
(Full Title of the Plan)

Chen Schor
Chief Executive Officer and President
Synta Pharmaceuticals Corp.
125 Hartwell Avenue
Lexington, Massachusetts 02421
(781) 274-8200

(Name, Address and Telephone Number, Including Area Code, of Agent For Service)

Indicate by check mark whether the Registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer

Accelerated filer

Non-accelerated filer (Do not check if a smaller reporting company)

Smaller reporting company

CALCULATION OF REGISTRATION FEE

Title of Securities to be Registered	Amount to be Registered	Proposed Maximum Offering Price Per Share	Proposed Maximum Aggregate Offering Price	Amount of Registration Fee
Common Stock, \$0.0001 par value	40,000,000(1) \$	0.27(2) \$	10,800,000(2) \$	1,087.56

(1) Consists of shares of common stock, par value \$0.0001 per share ("Common Stock"), of Synta Pharmaceuticals Corp. (the "Registrant"), which may be sold upon the exercise of options or issuance of stock awards which may hereafter be granted under the Synta Pharmaceuticals Corp. Amended 2015 Stock Plan (the "2015 Plan"). The maximum number of shares which may be sold upon the exercise of options or issuance of stock-based awards granted under the 2015 Plan is subject to adjustment in accordance with certain anti-dilution and other provisions of the 2015 Plan. Accordingly, pursuant to Rule 416 under the Securities Act of 1933, as amended (the "Securities Act"), this Registration Statement covers, in addition to the number of shares stated above, an indeterminate number of shares which may be subject to grant or otherwise issuable upon the operation of any such anti-dilution and other provisions of the 2015 Plan.

(2) This calculation is made solely for the purpose of determining the registration fee pursuant to the provisions of Rule 457(c) and (h) under the Securities Act based on the average of the high and low sale prices per share of the Common Stock on The NASDAQ Capital Market as of a date (July 18, 2016) within five business days prior to filing this Registration Statement.

EXPLANATORY NOTE

This Form S-8 Registration Statement is filed to register an additional 40,000,000 shares of Synta Pharmaceuticals Corp. (the “Registrant”) common stock reserved under the Synta Pharmaceuticals Corp. Amended 2015 Stock Plan. This Form S-8 Registration Statement registers additional securities of the same class as other securities of the Registrant for which the registration statement filed on Form S-8 (SEC File No. 333-206128) of the Registrant is effective. The information contained in the Registrant’s registration statement on Form S-8 (SEC File No. 333-206128) is hereby incorporated by reference pursuant to General Instruction E of Form S-8. The Index of Exhibits immediately following the signatures to this Registration Statement is incorporated herein by reference.

SIGNATURES

The Registrant. Pursuant to the requirements of the Securities Act of 1933, the Registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-8 and has duly caused this Registration Statement to be signed on its behalf by the undersigned, thereunto duly authorized, in Lexington, Massachusetts on July 21, 2016.

SYNTA PHARMACEUTICALS CORP.

By /s/ Chen Schor
Chen Schor
Chief Executive Officer and President

Each person whose signature appears below constitutes and appoints Chen Schor and Marc R. Schneebaum, and each of them singly, his true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution in each of them singly, for him and in his name, place and stead, and in any and all capacities, to sign any and all amendments (including post-effective amendments) to this Registration Statement of Synta Pharmaceuticals Corp. and to file the same, with all exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, granting to the attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite or necessary to be done in or about the premises, as full to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that the attorneys-in-fact and agents or any of each of them or their substitute may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act of 1933, this Registration Statement has been signed by the following persons in the capacities and on the dates indicated.

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ CHEN SCHOR</u> Chen Schor	Chief Executive Officer and President and Director (principal executive officer)	July 21, 2016
<u>/s/ MARC R. SCHNEEBAUM</u> Marc R. Schneebaum	Senior Vice President, Chief Financial Officer (principal financial and accounting officer)	July 21, 2016
<u>/s/ KEITH R. GOLLUST</u> Keith R. Gollust	Chairman of the Board	July 21, 2016
<u>/s/ BRUCE KOVNER</u> Bruce Kovner	Director	July 21, 2016
<u>/s/ DONALD W. KUFE, M.D.</u> Donald W. Kufe, M.D.	Director	July 21, 2016
<u>/s/ SCOTT MORENSTEIN</u> Scott Morenstein	Director	July 21, 2016
<u>/s/ WILLIAM S. REARDON, C.P.A.</u> William S. Reardon, C.P.A.	Director	July 21, 2016
<u>/s/ ROBERT N. WILSON</u> Robert N. Wilson	Director	July 21, 2016

INDEX OF EXHIBITS

Exhibit Number	Description
5.1*	Opinion of Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C. as to the legality of shares being registered.
23.1*	Consent of Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C. (included in opinion of counsel filed as Exhibit 5.1).
23.2*	Consent of Ernst and Young LLP, Independent Registered Public Accounting Firm.
24.1*	Power of Attorney to file future amendments (set forth on the signature page of this Registration Statement).
99.1	The Registrant's Amended 2015 Stock Plan (filed as Annex D to the Registrant's Definitive Proxy Statement on Schedule 14A filed June 8, 2016 (File No. 001-33277), and incorporated herein by reference).

* Filed herewith.

MINTZ LEVIN

One Financial Center
Boston, MA 02111
617-542-6000
617-542-2241
fax www.mintz.com

July 21, 2016

Synta Pharmaceuticals Corp.
125 Hartwell Avenue
Lexington, MA 02421

Ladies and Gentlemen:

We have acted as legal counsel to Synta Pharmaceuticals Corp., a Delaware corporation (the "Company"), in connection with the preparation and filing with the Securities and Exchange Commission (the "Commission") of a Registration Statement on Form S-8 (the "Registration Statement"), pursuant to which the Company is registering the issuance under the Securities Act of 1933, as amended (the "Securities Act"), of a total of 40,000,000 shares (the "Shares") of the Company's common stock, \$0.0001 par value per share (the "Common Stock"), that may be issued pursuant to the Company's Amended 2015 Stock Plan (the "Plan"). This opinion is being rendered in connection with the filing of the Registration Statement with the Commission. All capitalized terms used herein and not otherwise defined shall have the respective meanings given to them in the Registration Statement.

In connection with this opinion, we have examined the Company's Restated Certificate of Incorporation, as amended, and Restated By-Laws, both as currently in effect; such other records of the corporate proceedings of the Company and certificates of the Company's officers as we have deemed relevant; and the Registration Statement and the exhibits thereto.

In our examination, we have assumed the genuineness of all signatures, the legal capacity of natural persons, the authenticity of all documents submitted to us as originals, the conformity to original documents of all documents submitted to us as certified or photostatic copies and the authenticity of the originals of such copies. In addition, we have assumed that the Company will receive any required consideration in accordance with the terms of the Plan.

Based upon the foregoing, we are of the opinion that the Shares, when issued and delivered in accordance with the terms of the Plan, will be validly issued, fully paid and non-assessable.

Our opinion is limited to the General Corporation Law of the State of Delaware and we express no opinion with respect to the laws of any other jurisdiction. No opinion is expressed herein with respect to the qualification of the Shares under the securities or blue sky laws of any state or any foreign jurisdiction.

Please note that we are opining only as to the matters expressly set forth herein, and no opinion should be inferred as to any other matters. This opinion is based upon currently existing statutes, rules, regulations and judicial decisions, and we disclaim any obligation to advise you of any change in any of these sources of law or subsequent legal or factual developments which might affect any matters or opinions set forth herein.

We understand that you wish to file this opinion with the Commission as an exhibit to the Registration Statement in accordance with the requirements of Item 601(b)(5) of Regulation S-K promulgated under the Securities Act, and we hereby consent thereto. In giving this consent, we do not admit that we are within the category of persons whose consent is required under Section 7 of the Securities Act or the rules and regulations of the Commission promulgated thereunder.

Very truly yours,

/s/ Mintz, Levin, Cohn, Ferris,
Glovsky and Popeo, P.C.

Mintz, Levin, Cohn, Ferris,
Glovsky and Popeo, P.C.

Consent of Independent Registered Public Accounting Firm

We consent to the incorporation by reference in the Registration Statement (Form S-8) pertaining to the Synta Pharmaceuticals Corp. Amended 2015 Stock Plan, of our reports dated March 15, 2016, with respect to the consolidated financial statements of Synta Pharmaceuticals Corp. and the effectiveness of internal control over financial reporting of Synta Pharmaceuticals Corp., included in its Annual Report (Form 10-K) for the year ended December 31, 2015, filed with the Securities and Exchange Commission.

/s/ Ernst & Young LLP

Boston, Massachusetts

July 20, 2016
